

## REMARKS

Applicant has obtained the assistance of a patent attorney in preparing this Reply. The Reply addresses all outstanding matters of form and the prior art rejections and places the application in condition for immediate allowance. Reconsideration of the application in view of the following remarks is respectfully requested.

### Substitute Specification

In the Office Action, the disclosure of applicant's application was objected to because of grammatical and idiomatic errors. A substitute specification in conformance with 37 C.F.R. §1.125 accompanies this Reply. The substitute specification is provided in two forms: (1) a clean version and (2) a marked-up version in accordance with 37 C.F.R. §1.125(b)(2) that shows all changes that have been made. The substitute specification contains no new matter.

The substitute specification is in idiomatic English and corrects the grammatical errors present in the originally-filed specification.

### Claims 1 and 3, 4, and 6-9

Claims 1, 3, 4, and 6-9 were rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly

point out and distinctly claim the subject matter which applicant regards as the invention.

Applicant has rewritten the claims in idiomatic English. As rewritten, the claims comply with the requirements of 35 U.S.C. §112. The claims are fully supported by the specification and are not indefinite.

Claims 1, 3, 4, and 6-9 were rejected under 35 U.S.C. §102(b) as being anticipated by Japanese Patent JP 6116073 ("Komuten"). These rejections are respectfully traversed.

Applicant's invention relates to a method of sustaining crew during long-term space missions using a closed-loop food regeneration system. As described in the specification, applicant's approach allows human food be regenerated by rearing maggots. Most bio-waste from humans, animals and space plant crops may be recycled.

With the method of claim 1, fly eggs are frozen and brought into space. In space (e.g., during spaceflight or on a permanent planetary base in space), the frozen eggs are thawed. The thawed eggs are reared into maggots and pupa using human waste and plant crop waste. Once the maggots have been reared, they are used to form a maggot powder that is fed to the human crew on the mission as food.

Applicant has obtained an English translation of the Komuten patent and is submitting the English translation to the Patent Office in an accompanying Information Disclosure Statement. As the translation makes clear, the Komuten patent does not disclose

or suggest the features of claim 1.

With the arrangement described in the Komuten patent, fly larvae are used to recycle human and animal feces in a closed environment. The recycling process produces three products: humic soil, larvae biomass, and gas. According to Komuten, the humic soil is to be used as organic fertilizer, the larvae biomass is used as animal feedstuff, and the gas is used as fuel. (See, e.g., the paragraph bridging pages 2 and 3 of the Komuten translation.)

Komuten does not disclose raising fly larvae for human food or for use in a closed-loop food regeneration system. Moreover, with Komuten's approach it is not possible to recycle plant crops with the fly larvae, as only human and animal wastes are used in the rearing process. With applicant's approach, in contrast, there are four parts (humans, animals, maggots, and plant crops) that form a closed-loop food regeneration system. Each part has a role in waste recycling and food regeneration. The plant crops are a part of the closed-loop food regeneration system. The plants can use maggot residue as fertilizer while plant crop waste is used to rear the maggots. Because crops can be recycled, it is possible to grow many crops. These crops help to reduce the level of potentially harmful CO<sub>2</sub> produced by humans, animals, and maggots, and produce oxygen for these living beings to breath. The ability to recycle all wastes including crops into foods and useful materials for the four parts of the closed-loop system therefore makes the recycling

process more complete and forms a continuous waste-to-food cycle in a closed space environment.

Applicant's invention also involves the freezing of fly eggs in liquid nitrogen and the thawing of the frozen eggs to support maggot production for human food, whereas Komuten makes no mention of using liquid nitrogen or any other method to freeze eggs.

Because claim 1 requires the raising of maggots from frozen eggs, whereas Komuten makes no mention of frozen eggs and because claim 1 requires the raising of maggots from waste plant crops for human food, whereas Komuten makes not mention of waste plant crops or the use of maggots as human food, claim 1 is not anticipated by Komuten. Claim 1 is therefore patentable over Komuten.

Claims 3, 4, and 6-9 depend from claim 1 and define further aspects of applicant's invention. Claims 3, 4, and 6-9 are patentable because claim 1 is patentable.

The foregoing demonstrates that this application is in condition for allowance. Reconsideration of the application and allowance are respectfully requested.

Respectfully submitted,

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